

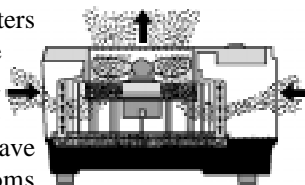


Jim Dulley

Thank you for your interest in writing to me about using a humidifier to keep your house more comfortable, protect it from damage and lower your heating bills. A humidifier lowers your heating bills by allowing you to set your furnace thermostat lower without feeling chilly. When the room air is overly dry, the moisture from your skin evaporates quickly and this cools you similar to sweating. The chart below will give you a rough idea of the capacity of humidifier you will need. Very cold climates often need slightly larger humidifiers and very mild areas need slightly smaller ones.

On the following pages, I have listed manufacturers of the highest quality humidifiers for home use. Page four shows an excellent description of the advantages and disadvantages of the most common designs of humidifiers you will find at

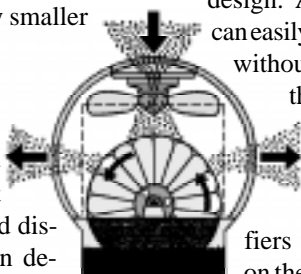
most home centers and hardware stores. If you have small children that may have access to rooms with the humidifier



Typical evaporator

in them, it would be wise to avoid the steam mist (vaporizer) design. The steam outlet may scald a child's hand. I use a quiet ultrasonic model in my bedroom at night and an evaporative type near my corn/pellet stove in my living room.

The evaporator designs (pictured above) generally can have the greatest moisture output. Most larger console models use this design. A large capacity console model can easily humidify an entire house. Even without the furnace blower circulating the air throughout the house, the moisture will naturally migrate to all the rooms.



Even though many humidifiers have antimicrobial treatments on the wicks, filters and plastic hous-

ings, it is a good idea to clean them regularly per the manufacturer's instructions. The last thing you want is to have mold spores or bits of bacteria being introduced into the room air.

In all but the mildest climates, shoot for a humidity level just slightly less than the level that causes window condensation. On colder days, you will have to set the humidifier to run less or get replacement windows with more efficient glass to avoid condensation. If you have hard water in your area, you may find a white powder near an ultrasonic humidifier. This is the hard water ion deposits as the water evaporates in the air.

The prices of humidifiers can range from as little as \$20 for small tabletop models to more than \$100 for large decorative console models. You can find them at many discount and home center stores and they are often on sale. Also check the manufacturers' web sites for specials. For example, Holmes Products has some discounted special items which they sell online.

Humidification Selection Guide

Construction of Residence	Size of Residence in Square Feet					
	500	1000	1500	2000	2500	3000
Water Output Capacity, Gals./24 Hours						
Tight — well insulated, vapor barrier, tight storm doors/windows with weatherstripping, dampered fireplace	*	1.40	3.20	4.90	6.60	8.30
Average — insulated, vapor barrier, loose storm doors/windows, dampered fireplace	0.50	3.00	5.50	8.00	10.50	13.00
Loose — little insulation, no storm doors/windows, no vapor barrier, undampered fireplace	1.00	4.00	7.00	10.00	13.10	16.10

NOTE: If there is uncertainty as to the type of home construction, the values shown in the average category may be used.

*Humidification not necessary to maintain conditions of 70°F (21.1°C) and 30 percent relative humidity. An amount of approximately 2 gallons per 24 hours provided by internal sources of humidity (based on a family of four) has already been deducted from the above values.

Maximum Indoor Humidity Level to Avoid Window Condensation

Outdoor Temperature	Maximum Indoor Humidity Level - Single Pane - %	Maximum Indoor Humidity Level - Double Pane - %
-30	3	27
-20	6	30
-10	8	35
0	13	40
10	20	46
20	26	52
30	32	59
40	44	68

The above chart is based on an indoor temperature of 70°F and a wind speed of 15 miles per hour. Use this only as a guideline. The actual humidity level where condensation forms depends on your specific window design, special coatings, thickness of air space, and type of gas in between glass panes. The frame may also begin to sweat before the glass itself.

Use and Care Recommendations from The Environmental Protection Agency

- Empty the tank, wipe all surfaces dry, and refill the water in portable humidifiers daily to reduce any growth of microorganisms; follow the mfgs. instructions for changing water in console humidifiers. Unplug the unit from the electrical socket first. Use water with low mineral content to prevent the buildup of scale and the dispersal of minerals into the air.
- Clean portable humidifiers every third day. Empty the tank and use a brush/scrubber to clean it. Remove any scale, deposits, or film that has formed on the sides of the tank or on interior surfaces, and wipe all surfaces dry. Unplug the unit. Follow the mfgs. suggestions on the use of cleaning products or disinfectants. In the absence of recommendations, clean all surfaces coming in contact with water with a 3 percent solution of hydrogen peroxide. If you use any cleaning or disinfecting agent, rinse the tank thoroughly with several changes of tap water to prevent dispersal of chemicals into the air during use.
- Keep steam vaporizer humidifiers out of the reach of children. Steam and boiling water may cause burns.
- Do not permit area around humidifier to become damp. If dampness occurs, turn the output volume down. If output volume cannot be turned down, use the humidifier intermittently. Do not allow absorbent materials, such as carpeting, drapes or table cloths, to become damp.
- If water condenses on windows, walls, or pictures, either relocate the humidifier, lower its humidistat setting, or reduce its use.

Selected Manufacturers of Portable Humidifiers

Selected Manufacturers of Portable Humidifiers						
Company	Model	Style	Type	Capacity	Coverage	Output/Day
ESSICK AIR PRODUCTS 5800 Murray St. Little Rock, AR 72209 (800) 826-2665 www.essickair.com	690 Series	console	evaporative	5.5 gallons	2,300 sq. ft.	11.0 gallons
	826-800	space saver		6.0 gallons	1,700 sq. ft.	8.0 gallons
	336-500	tabletop		3.2 gallons	1,000 sq. ft.	5.0 gallons
	726-000			1.7 gallons	560 sq. ft.	2.3 gallons
	DP3-200			1.6 gallons	750 sq. ft.	3.3 gallons

Features - The "690 Series" has a variable-speed fan to spread the moist air efficiently in the air. There are concealed castors on the bottom of the unit so you can move it about easily. The units have two water bottles each that hold 2.75 gallons. The water bottles come with a refill hose making them easy to fill. There are refill lights that indicate when bottles need refilling. The control panel is hidden so the lines remain clean on the cabinet. The cabinet is available in a driftwood or light oak woodgrain finish. The automatic humidistat senses when air needs more moisture and turns the fan on and off as needed. The power pack is removable for cleaning. Model "336-500" has three-speed operation, including a quieter setting for nighttime sleeping. The humidistat automatically maintains the desired humidity level. There are two water bottles that are easy to carry and fill. Model "DP3 200" is an air purifier and humidifier in one unit. It cleans a 12' by 14' room 4 times per hour. It has Clean Air Delivery Ratings (CADR) of 110 for pollen, 125 for dust, and 90 for smoke. Also removes bacteria and pet dander. There is a lock-on feature to run only the air purifier during the summer. This unit also has a quiet nighttime setting and an automatic humidistat. Model "826-800" has a special, compact space saving design for whole house humidification. The automatic humidistat turns the unit on and off to maintain desired humidity level. The refill light reminds you when you need to add water. The castors allow you to move the unit from room to room easily. There are many other models to choose from.

EMERSON MOISTAIR PO Box 4100 St. Louis, MO 63136 (800) 237-6511 (314) 553-2000 www.moistair.com	HD1300W	console	evaporative	4.6 gallons	2,700 sq. ft.	13.0 gallons
	HD6000	tabletop		3.4 gallons	1,300 sq. ft.	6.0 gallons
	HD230			1.2 gallons	600 sq. ft.	2.5 gallons

Features - Model "HD1300W" has an automatic humidistat that keeps humidity at the level you select. It is available with a bleached oak woodgrain accent with a white cabinet. It has two easy-to-fill bottles that are 2.3 gallons each. Equipped with four easy-to-roll castors so you can move the unit easily. A fill light tells you when water is low and the unit shuts off automatically. The unit has variable speed air flow control. Available with single or dual fan control. The filter system is a honeycomb that floats in the water reservoir and is treated with a special compound to retard bacterial growth — keeps minerals and solids out of the humidified air. Model "HD6000" has three-speed air flow control for your comfort. Equipped with two easy-to-fill 1.7 gallon bottles. Model "HD230" can be used during the fall and winter months as a humidifier to keep moisture in the home and then use it during hot summer days for a fan. It is equipped with three-speed air flow control for comfort. The unit has four rubber feet so it can be placed safely on a dresser or table without scratching the furniture. The grill can be rotated to get the moisture where it is needed. There are three locations on the top of the unit where the cord can exit that allows flexibility of unit placement. There are many other models available.

HOLMES PRODUCTS 1801 Commerce Dr. Piqua, OH 45356 (800) 233-5921 www.holmesproducts.com	HM508-UC	tabletop	warm mist	2.2 gallons	600 sq. ft.	2.5 gallons
	HM3655		evaporative	3.4 gallons	700 sq. ft.	2.3 gallons
	HM485		ultrasonic	1.5 gallons	650 sq. ft.	2.8 gallons

Features - The "HM3655" humidifier runs up to 36 hours without refilling, allows you to select the exact humidity level you prefer and lets you know when you need to replace the filter. The Microban antimicrobial protection helps keep your humidifier clean. The "HM508-UC" unit runs up to 22 hours on a single fill. It has a removable tank for easy filling and an automatic shut-off when the tank is empty. It has a two-speed fan to control the amount of humidification. The "HM485" ultrasonic unit is whisper-quiet.

HUNTER FAN CO. 2500 Frisco Ave. Memphis, TN 38114 (800) 971-3267 www.hunterfan.com	33202	tabletop	evaporative	2.0 gallons	1,175 sq. ft.	2.0 gallons
	32300			3.0 gallons	1,475 sq. ft.	3.0 gallons
	33250			2.5 gallons	1,350 sq. ft.	2.5 gallons
	33350			3.5 gallons	1,600 sq. ft.	3.5 gallons

Features - Model "33202" has a night light that illuminates the water tank with a soft glow and a permanent wick filter that never needs to be replaced. The filter has a special bacteria guard treatment that protects against the growth of microorganisms so germ-free moisture is sent out into the air. Special antibacterial and antifungal agents are molded into the plastic parts to prevent the growth of any microorganisms or bacteria. The humidifiers provide water as needed to eliminate stagnant water around the filter that can breed bacteria and germs. The automatic moisture regulation system automatically adjusts the output to the moisture in the air. Model "33250" also has an adjustable humidistat and the permanent wick filter to maintain your desired humidity level. An indicator light tells when the humidity level has been reached. There are two fan speeds to also help adjust the humidity output rate. The units will automatically shut off when the water reservoir is empty. A refill light also alerts you to this situation. The humidifiers are designed to only allow a minimal amount of water out of the tank. Other models available have a replaceable paper wick filter element. There is a five-year limited motor warranty.

KAZ 250 Turnpike Rd. Southborough, MA 01772 (800) 332-1110 www.kaz.com	Honeywell HWM-2030	tabletop	warm mist	1.8 gallons	700 sq. ft.	3.0 gallons
	Honeywell HCM-2000		cool mist	2.0 gallons	1350 sq. ft.	4.0 gallons
	Honeywell HCM-3060			4.4 gallons	1950 sq. ft.	6.0 gallons
	Robitussion DH-750		warm mist	2.0 gallons	not available	2.5 gallons
	Duracraft DH-890		cool mist	.80 gallons	750 sq. ft.	2.0 gallons
	Duracraft DH-910		warm mist		900 sq. ft.	2.0 gallons

Features - The "Honeywell" models have an adjustable humidistat that maintains the moisture level that you select. The units will turn themselves off automatically when the tank is empty. Model "HCM-3060" has three different moisture settings to meet your personal preferences. It is equipped with power and desired humidity lights so you know that the unit is operating correctly. It has two clear, removeable water tanks that are easy to carry and fill. Model "Duracraft DH-910" has a dishwasher-safe medicine dispenser. It has a removable clear water tank, the handles are no drip and can be carried and filled easily. It shuts off automatically if the tank is empty, removed or tipped over accidentally.

Selected Manufacturers of Portable Humidifiers

Company	Model	Style	Type	Capacity	Coverage	Output/Day
KAZ, cont'd.	Kaz 3400	tabletop	evaporative	2.0 gallons	1,000 sq. ft.	2.0 gallons
	Vicks V3500			2.0 gallons		2.5 gallons
	SafetyLight 2200		warm steam	2.0 gallons		2.0 gallons
	HealthMist 4220		cool mist	2.0 gallons	1,000 sq. ft.	2.5 gallons
	Vicks V5100		ultrasonic	1.5 gallons	600 sq. ft.	1.7 gallons

Features - The evaporative units can be filled without removing the cover. The water level indicator tells you when to refill and how much water to add. It is equipped with a two-speed switch. The warm steam unit is a vaporizer and has a chamber for an inhalant. It has patented safety vents that regulate the steam flow, preventing overboiling. The triple-wall construction maintains the reservoir water at a safe temperature. The carbon electrodes operate efficiently in any water condition, they will not rust or corrode. The outer cap is cool-to-the-touch so it can be handled safely. The unit shuts off automatically when the water reaches a minimum level. Equipped with a night light for additional safety and convenience. The cool mist units have an air-cleaning filter that removes dust, pollen, odors, and tobacco smoke from the room air, removing 93 percent of particles as small as pollen. Equipped with a lifetime-lubricated motor. There is a directional spout/grill that varies the vapor direction both horizontally and vertically. The "HealthMist" features high and low vapor settings, the vapor is whirled through a vortex chamber to provide a superfine mist for quicker evaporation. The "Vicks V3500" has a removable tank so it is easy to fill. The tank bottom is sloped for complete emptying during operation. The wicking filter has a built-in bactericide to clean the air and trap minerals, pollutants and bacteria from the water. Kaz also offers a personal humidifier that can be used almost anywhere. See below for picture and features of the personal humidifier.

LASKO 820 Lincoln Ave. W. Chester, PA 19380 (800) 233-0268 (610) 692-7400 www.laskoproducts.com	1100	tabletop	evaporative	1.5 gallons	1,100 sq. ft.	2.5 gallons
	1115			1.75 gallons	1,500 sq. ft.	3.0 gallons
	1120			2.0 gallons	1,800 sq. ft.	4.0 gallons
	1128			4.5 gallons	3,200 sq. ft.	9.0 gallons
	1150			6.0 gallons	3,800 sq. ft.	12.0 gallons
	1130/1140	console		6.0 gallons	4,200 sq. ft.	12.0 gallons

Features - These humidifiers have a pump operated system that allows water to be constantly moving, similar to a waterfall. This movement of water eliminates problems associated with standing water such as a breeding ground for microorganisms. The humidifiers have a clear window which lets you see the water circulating. It also lets you know when the unit needs to be filled. The console models have castors so they can be moved easily on any type of surface. They have three speeds, an adjustable humidistat with indicator light and two easy to change evaporative filter pads. Filter pads last about six months. Consoles available in grey or wood grain. See illustration and features on page four.

SLANT/FIN CORP. 100 Forest Dr. Greenville, NY 11548 (800) 775-4552 (516) 484-2600 www.slantfin.com	GF-100	tabletop	warm mist		400 sq. ft.	
	GFH-150			2.0 gallons		2.5 gallons
	GF-200					
	GF-350			3.5 gallons		4.0 gallons

Features - The humidifiers have a special dual-germicidal process that combines the germ-killing power of ultraviolet light and vaporization — kills 99.99 percent of bacteria, molds and spores that can breed in tap water. Model "GF-350" has a stainless steel hot water reservoir with a stainless steel scraper included. It will humidify for two to three days continuously without a refill. The "GFH-150" humidifiers and other models have a built-in medicine cup for use of medications during respiratory illnesses. Mineral absorption pads are included to minimize mineral buildup. These humidifiers produce absolutely no white dust and have silent operation. Three-year limited warranty.

VORNADO 415 East 13th St. Andover, KS 67002 (800) 234-0604 www.vornado.com	Vortex Humidifier 30	tabletop	evaporative	2.8 gallons	850 sq. ft.	2.8 gallons
	Vortex Humidifier 40			4.2 gallons	1,750 sq. ft.	4.2 gallons

Features - The patented spill-proof bottle design allows for easy filling and carrying. The humidifiers are equipped with three fan speeds to allow for precise humidity control. The units have a five-year warranty. Both humidifiers have large enough tanks for uninterrupted 24-hour operation. Both units use the wick filtering system; by pulling air through the wick the water is evaporated putting moisture into your home.

WINDCHASER PRODUCTS 4310 Del Ray Ave. Marina Del Ray, CA 90292 (800) 405-2943 www.windchaserproducts.com	Ionic Air Washer AAT2003	tabletop	evaporative	1.9 gallons	600 sq. ft.	3.0 gallons
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Features - The "Air Washer" humidifies by drawing air through water. This process eliminates small airborne particles just like the outdoor air is cleaned by rain. The air is simultaneously humidified by a special dishwasher-safe disc which eliminates the need for any replacement filters. It is equipped with an antibacterial safety system and two modes of operation. It is ideal for use between autumn and late spring pollen seasons.

Humidifiers by Kaz

The warm steam vaporizers boil the water and produce a pure steam vapor which is released into the air. The vapor is bacteria-free and leaves no white dust. The vaporizer shuts off automatically when the water reaches minimum level.

The outer cap is cool to touch for safety. There is a night light that provides additional safety and convenience.


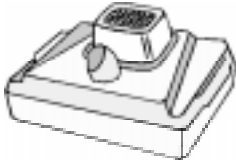





Compact, lightweight the personal humidifier can be used anywhere. The dual-voltage unit operates with a plastic water bottle. This model fits on a nightstand and travels well. It is whisper-quiet and adds beneficial mist to dry indoor air.

It has a directional mist outlet and two output settings. This allows you to control the direction and amount of mist "plume." Unit can be converted to other voltages for worldwide use.



Selector Guide for Various Humidifier Types

Type	How it Works	Advantages	Disadvantages
Evaporative 	Water is drawn into a belt, wick or filter through capillary action. A fan pulls air through the filter, allowing the water to evaporate and sends it into the room.	<ul style="list-style-type: none"> • Uses little energy. • Uses tap water. • Easy to clean. • No spray, unlikely to spread bacteria and white dust. 	<ul style="list-style-type: none"> • The fan and airflow can be noisy. • Periodic filter replacement adds to operating cost. Filters often available only from manufacturer. • Must be cleaned regularly to prevent growth of undesirable microorganisms. • Removes heat from the room.
Impeller or Cool Mist 	The impeller and fan assembly dips into a water tank. As the cone spins, it pumps water upward. The fan blades throw water droplets out a nozzle and into the air.	<ul style="list-style-type: none"> • Uses little energy. • Needs fewer refills than other types. • Tank is very easy to clean. • Very inexpensive to buy. 	<ul style="list-style-type: none"> • Can spew microorganisms along with water. • Can splatter water. • Can emit white dust if used with hard tap water, it needs distilled or soft water or a demineralization cartridge. One year's running cost can exceed purchase price. • Sloshing noise from the fan and impeller assembly can be annoying.
Steam Mist or Vaporizer 	Water flows into a small heating chamber and it is kept at the boiling point. As the water boils, it releases moisture through a spout and into the air.	<ul style="list-style-type: none"> • Uses tap water. • Requires no filters. • No moving parts. • Boiling water kills microorganisms; water vapor is sterile. • Emits little or no white dust. 	<ul style="list-style-type: none"> • High energy consumption. • Heating element may need extra cleaning to remove any buildup of hard water minerals. • Mist and boiling water from tipped over tank can scald. • Can emit bits of dead microorganisms causing allergic reactions. • Noisy.
Warm Mist 	Warm mist humidifiers are a type of steam vaporizer humidifier in which the steam is cooled before exiting the machine. A fan in the spout mixes cool air with the steam which produces mist somewhat warmer than room air.	<ul style="list-style-type: none"> • Uses tap water. • Requires no filters. • No moving parts. • Boiling water kills microorganisms; water vapor is sterile. • Emits little or no white dust. • Less risk of scalding from mist. 	<ul style="list-style-type: none"> • High energy consumption. • Heating element may need extra cleaning to remove any buildup of hard water minerals. • Can emit bits of dead microorganisms causing allergic reactions. • Noisy. • Boiling water from tipped over tank can scald.
Ultrasonic 	Water flows from a reservoir to a transducer and nebulizer (small electronic components). Nebulizer oscillates about 1.7 million times a second, churning the water into a cool mist.	<ul style="list-style-type: none"> • Uses little energy. • Releases very few microorganisms into the air. • Quiet. 	<ul style="list-style-type: none"> • Emits annoying white dust if used with most tap water. • May require soft or distilled water or a demineralization cartridge. • Very hard water can leave hard to remove mineral deposits on nebulizer. • Can emit bits of dead microorganisms causing allergic reactions.

Evaporative Humidifier (Model 33202) from Hunter

- NiteGlo night light illuminates the water tank with a soft glow
- Automatic shut-off when tanks are empty
- Refill light signals that humidifier needs to be refilled
- Adjustable humidistat maintains your desired humidity level, light indicates when level is reached
- Automatic moisture regulation system automatically adjusts output to the moisture in air
- Three speeds to control moisture output rate
- Tank specially designed to simplify filling, make carrying easier
- Five-year limited motor warranty

Ionic Air Washer AAT2003 from WindChaser

- No replacement filters
- Easy to clean, dishwasher safe disks
- Antibacterial safety system
- Two whisper quiet operating modes
- Detachable water tank with handle
- On/Off indicator
- Water output - 3 gallons
- Water capacity - 1.9 gallons
- Suitable for 600 sq. foot room

The Ion Humidifying Air Washer washes and humidifies the air by drawing air through water. This process eliminates small airborne particles. At the same time the air is humidified by a disc which eliminates the need for any replacement filters.

**Evaporative Humidifier (Model 1128) from Lasko**

- 9.0 gallon output per day
- Humidifies up to 2,000 sq. ft., ideal for multiple rooms.
- Water capacity — 4 1/2 gallons
- Three control speeds with on/off indicator light



- Adjustable humidistat with indicator light
- Removable clear water reservoir with dual handle for easy filling
- The clear-view water window shows the unit working — waterfall
- Castors for mobility on any surface
- Evaporative filter pad is included
- Continuous pump-driven circulation